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ABSTRACT

Effects were studied of 12 teacher and 11 student characteristics (including SES and ethnicity) on 7 student outcomes--cognitive, affective and coping skills. Fifty-three sixth grade teachers and 1,190 Black, Chicano and Anglo students participated. A series of covariance and regression analyses showed significant curvilinear and interaction effects, after true-score and unit-of-analysis corrections. This paper reports on the invalidity of a standardized achievement test as a measure of gain, or of teacher effects; and on several teacher-student interaction effects on self-esteem, including ethnic differences in reactions to teaching. (Author)

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TEACHER EFFECTS ON STUDENT ACHIEVEMENT AND SELF-ESTEEM

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Teacher Effects on Student Achievement and Self-Esteem

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The growing call for teacher accountability has led a good many people to assume that one can tell how good a job teachers have done by measuring their students' achievement gains over the year. Most teachers know or sense that this, by itself, is not an adequate or fair method but more adequate models are only now being developed and tested. Actually, there are numerous influences on student gain besides teacher behavior, and more effects than academic progress, alone. In the Teaching-Learning Interaction Study, we have been developing a ten-stage analytic model to permit accurate description of the ways in which as many as twelve teacher characteristics and nine student characteristics, plus student SES and ethnicity, affect any one of seven outcomes of schooling, singly or in interaction. The student outcome measures include standardized achievement, self-esteem, attitude toward school, evaluation of the teacher, self-rated coping skill and attitude toward life, and peer-rated coping skill. The model uses linear regression to assess such things as demographic effects on student pre-test scores; and covariance analysis to assess the effects of the nineteen teacher and student variables on "gain" on each outcome measure. Both linear and quadratic, main and interaction effects are investigated. "True score" corrections are made for instrument reliability, and a test is performed to tell whether nested variance rules out use of individual student scores as the unit of analysis.

Fifty-three sixth grade teachers and their 1190 students participated in four integrated, tri-ethnic Austin schools where the students were heterogeneously grouped by ethnicity and by entering achievement level. The study is designed to replicate the first-year analysis by repeating it with (mostly) the same teachers but new classes of students in the subsequent year. Findings will also be tested by replication in Daviess County, Kentucky, across two years.

The students were assessed in October and April with the Comprehensive Test of Basic Skills (Social Studies) and the Piers-Harris Self-Concept Questionnaire, as well as five other measures. Teacher characteristics included seven scales measured by the Adjective Self-Description: social warmth, courtesy, efficiency, introversion, anxiety, individualism, and attractiveness; two scales from the incomplete-sentence Views of Teaching: attitude and coping skill; and Ryans' three factors, derived from ratings based on four to five classroom observations: Kindly-Understanding, Systematic-Organized, and Stimulating-Inventive.

By the end of the analysis, for descriptive purposes, the teachers and the students were divided roughly into high, middle and low thirds on each of the measures. This way, it could be said that teachers high on KU, for instance, had a more beneficial effect on a certain kind of student than middle or low teachers, if the data fell out that way. Such a statement more readily allows a "prescription" for teaching, as an ultimate product of the research.

In a preliminary covariance analysis, two of the nine teacher self-report variables showed a direct, curvilinear effect on CTBS gain: teachers either low or high on individualism had slightly greater pupil gains than medium teachers; teachers "low" (i.e., less extremely positive) on courtesy produced the most student gain on CTBS, followed in order by teachers who described themselves as extremely courteous or very courteous. When cast against the self-esteem outcome, two teacher variables showed a significant intercept difference without a slope difference: teachers with a highly positive attitude (ASD) produced greater increase in student self-esteem than medium or low teachers, in that order. Teachers who rated themselves high on efficiency produced larger gains in student self-esteem than medium or low teachers, in that order. These results must be checked by the later, ten-stage analytic model, however, particularly to see if they survive the true-score and unit-of-analysis tests.

However, a far more important finding was that 12 of the 24 analyses showed significant slope differences among the three different levels of teachers. Teachers' self-rated efficiency, anxiety, attitude, coping

skill, etc., had different effects on student learning and on student self-esteem -- but these effects cannot be explained in any clear, certain way when this simple an analytic model is used. The slope differences might be due to a difference in the range of variance in the pre and post-test or to a difference in the correlation of pretest and posttest in the different groups. These inextricable alternatives could reflect a variety of specific teacher influences but they are impossible to identify by this simple a method.

In the full, ten-stage analyses that have been performed so far, here are a few, salient results. The CTBS standardized achievement test was the strongest predictor of posttest achievement ($r = .74$), as might be expected. It also, significantly, affected pretest attitude toward school (1.0% of the variance) and peer-rated coping skill (15.8%). Just as significantly, it did not affect the pretest scores on Student Evaluation of Teacher; students' ratings were not biased by their different achievement levels. CTBS was quite strongly affected (11.1% of variance) by ethnicity (Anglo $<$ Chicano $<$ Black) and by SES (3.8%). This kind of test, however, only remotely represents the specific curricular content covered during the year. Further, as a norm-referenced measure it is insensitive to individual gain. Its own sixth grade standardization sample showed only a two-point annual gain, at a mean of 21. Finally, the range of achievement (2nd to 11th grade) in 6th grade requires the use of two different "levels" of test, and these turn out not to be well-matched when converted to a presumed "universal" scale. For such reasons, it was no surprise that there turned out to be no significant "teacher effects" on this kind of "gain measure;" nor any student effects, either, except for some tiny demographic differences. The most significant finding is an unequivocal negative: standardized achievement tests such as this should not be used to assess student gain, nor to make any judgments about "teacher effectiveness."

On the other hand, though the Piers-Harris measure of self-esteem has a strong pre-post stability ($r = .68$), in the limited room that was left for outside influences it reacted to the three teacher characteristics measured by classroom observation. First, it must be reported that its

pretest was positively related to both self-rated and peer-rated coping skill (10.2% of the variance, in each case); to attitude toward school (6.6%); and to Student Evaluation of Teacher (2.9%). Just as important, it was not affected by ethnicity, though it was by SES (2.3%). The posttest on self-esteem (adjusted for pretest) was significantly affected by all three teacher observation variables, two in interaction with student pretest level and one as a curvilinear main-effect.

For students who had low initial self-esteem, their changes in self-esteem were inversely related to teacher Kindly-Understanding; whereas for students starting average or high, their final self-esteem was directly related to their teachers' Kindly-Understanding behavior during the year. A similar pattern was found for Systematic-Organized teacher behavior. It correlated positively with student gains in self-esteem, for students initially average or high; but, inversely with students whose initial self-esteem was low. Such a pattern, if it reappears on replication, calls for study of the whys of this negative reaction of students with low self-esteem.

Stimulating-Inventive teacher behavior had a curvilinear relationship to changes in self-esteem. Students with teachers either high or low on SI had higher final self-esteem than those with teachers who showed average SI behavior.

There were significant interaction effects, too, between teacher KU and SI and student ethnicity. Among Blacks, high KU teachers had an adverse effect on self-esteem; medium teachers were better. Among Anglos, too, medium KU teaching affected self-esteem most positively. Among Chicanos, however, high KU teaching produced the best effect, followed by medium and low KU.

Highly Stimulating-Inventive teaching affected Black's self-esteem adversely; medium SI had a much better effect. Among Chicanos, on the other hand, high SI teaching affected their self-esteem more positively than did lower SI levels. Anglos' self-esteem was almost totally unaffected by teacher SI level.

Five sets of conclusions seem safe to draw at this point:

1. Standardized achievement tests almost certainly are not valid measures of individual gain or "teacher effects." Such tests do,

however, provide a highly reliable measure of the relative performance levels of different individuals and different ethnic or socioeconomic groups. They tend to be confirmed by peer judgments. If used purely for constructive, diagnostic purposes, they may have a useful function. They must not, however, mistakenly be interpreted as evidence of differences in "innate ability" -- or even of skill when faced with non-academic problems, where the middle-class symbol system is not inherently prerequisite to success.

2. Student self-esteem can now be reliably measured; it tends to be quite stable across time; but it is somewhat sensitive to teacher behavior, in ways complexly affected by initial level of self-esteem and ethnicity. Why such different reactions occur is an important subject for next-step research. Even this "conclusion," however, must await the outcome of the replication studies now in progress.
3. Blacks, Chicanos and Anglos react quite differently to a given style of teaching. How and why this occurs will require perceptive, "clinical" inquiry, as a next step, before sound teaching prescriptions can be selectively designed.
4. Quite certainly, only analytic models that accommodate multiple inputs and multiple outputs, with allowance for curvilinearity, interaction effects, measurement reliability, and possible nesting of variance within school settings, will allow us to make either accurate or insightful statements about real-life learning. Such an approach begins to take on the richness of the clinical approach, with the advantage of objective, quantified tests of all findings. It is necessarily more expensive than one-variable or two-variable approaches; but not prohibitively so, considering its far greater ultimate explanatory power.
5. The preliminary analyses indicate that the self-reported teacher characteristics may also have a significant impact on student outcomes.